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USSR: Recent Trends in Oil Use

Summary

The Soviet oil balance--the combination of oil production, consumption, and exports--is undergoing shifts that, if continued, could have a considerable impact on Moscow's future energy use and foreign trade. In 1983 the USSR reduced apparent oil consumption by some 70,000 b/d--roughly one percent. Gas substitution has apparently played a major role in this reduction. Simultaneously, growth in oil production has slowed markedly, with a small absolute decline possible this year. With consumption down and production nearly flat, total net exports rose by more than 200,000 b/d between 1981 and 1983. [redacted] 25X1

With the tightening oil balance of the last few years, the Soviets appear to have chosen to hold down the growth in domestic oil consumption rather than reduce exports. Moreover, changes in Soviet oil trade behavior--with net hard currency exports of oil rising and oil exports to Eastern Europe showing an absolute decline--possibly signal an important policy choice. Moscow appears to be trying to stabilize hard currency earnings in the face of lower world prices for oil and also for gold, another major hard currency earner. [redacted] 25X1

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This memorandum was prepared in the Econometric Analysis Divison of the Office of Soviet Analysis. Comments and queries may be addressed to [redacted] 25X1

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Basic Trends in the Oil Balance

1. We believe there has been a change in the pattern of oil consumption and exports since 1981 (see Figure 1 and Table 1).

- After growing at an average rate of slightly over 5 percent annually in 1971-81, oil production growth slowed to just over one-half percent a year in 1982-83 and output may decline slightly this year.

- Increases in apparent consumption of oil kept pace with production gains in 1971-81--over 5 percent per year. However, consumption declined by almost one percent in 1983.[1]

- Net oil exports rose at over 3 percent per year in 1982-83, down from the 1971-81 annual rate of about 5 percent.[2] Gross oil exports in 1982-83 rose by over 5½ percent per year, higher due principally to an increase in the reexport of oil from the Middle East.

[1]Soviet oil consumption is measured as "apparent consumption"--production minus net exports. No allowance is made for changes in oil stocks. The Soviets publish data in the annual Narodnoye Khozyaystvo only on changes in total energy stocks and it is impossible to infer reasonable ranges for changes in oil stocks from such limited information. It is clear, however, that oil stocks would have had to fall steadily since 1981 for domestic use of oil to have at least held steady. We consider this to have been very unlikely, given the expansion of oil pipelines and refineries in those years. 25X1

[2]There is also uncertainty in the trade data. The Soviets stopped publishing information on oil export volumes in 1976. 25X1

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Figure 1
USSR: Oil Trends, 1970–83

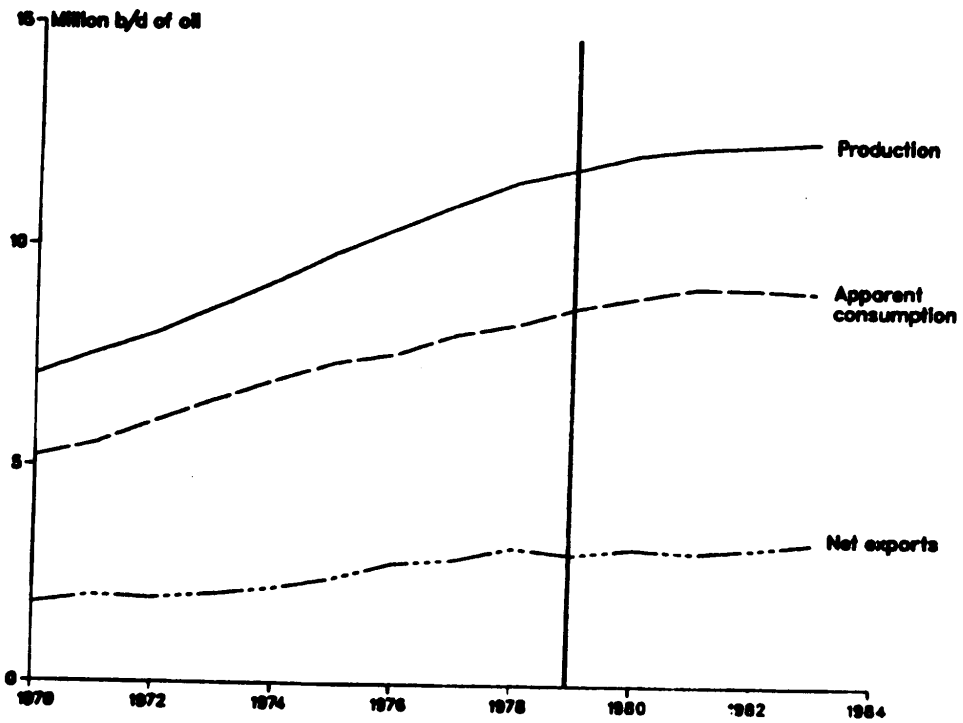

Table 1

Soviet Oil balance (million b/d)*

	1980	1981	1982	1983
Production	12.03	12.18	12.25	12.33
Apparent Consumption	8.84	9.05	9.06	8.99
Foreign Trade Summary				
Net Oil Trade	3.19	3.13	3.19	3.34
Exports	3.27	3.22	3.39	3.59
Imports	0.08	0.10	0.20	0.25
Hard Currency Trade	0.89	0.86	1.08	1.18
Exports	0.97	0.91	1.24	1.38
Imports	0.08	0.06	0.16	0.20
Communist Trade	1.99	2.00	1.83	1.84
Exports	1.99	2.00	1.83	1.84
Imports	0	0	0	0
Other Trade**	0.31	0.27	0.29	0.32
Exports	0.31	0.31	0.32	0.37
Imports	0	0.04	0.03	0.05

*Some totals do not equal the sum of their sub units due to rounding.

**Non-hard currency trade with non-communist countries, principally Finland and several developing countries.

- Soviet oil policy, therefore, appears directed towards holding down domestic consumption in order to increase oil exports. Moreover, net hard currency oil exports have increased while net exports to communist and other soft currency countries have fallen. Moscow appears to be attempting to maintain hard currency earnings in the face of lower world oil prices and a bleak market for gold, another major hard currency earner. 25X1

Links Between Consumption, Substitution and Exports

2. The roughly 60,000 b/d reduction in the annual apparent consumption of oil since 1981 was much more than offset by a 1.2 million b/doe (barrels per day of oil equivalent) increase in the apparent annual consumption of gas, at least some of which was for oil substitution (Table 2). This substitution probably took the form of both increased use of gas in new units (such as new power plants) as well as increased replacement of oil by gas where oil was being used. The amount of oil used in the electric power sector has probably remained unchanged since 1980, with no significant decline foreseen before the late 1980s. Lower oil usage in other industrial sectors presumably was more important, but the actual source of reduced oil use is unclear. 25X1

3. While apparent consumption has begun to fall slowly, Soviet gross oil exports increased by 366,000 b/d (barrels per day) between 1981 and 1983. Increased exports came from three primary sources:

Table 2
Soviet Energy balance (million b/doe)

	1981	1982	1983
Production-Total	**28.36**	**29.09**	**29.81**
Oil	12.18	12.25	12.33
Gas	7.69	8.28	8.86
Coal	6.58	6.71	6.70
Primary electricity	1.25	1.25	1.33
Other*	0.66	0.60	0.59
Apparent Consumption-Total**	**24.02**	**24.70**	**25.35**
Oil	9.07	9.05	8.99
Gas	6.71	7.30	7.90
Coal	6.42	6.60	6.65
Primary electricity***	1.16	1.15	1.22
Other*	0.66	0.60	0.59
Net Exports-Total	**4.34**	**4.39**	**4.46**
Oil	3.11	3.20	3.34
Gas	.98	0.98	0.96
Coal	.16	.11	0.05
Electricity***	.09	.10	0.11

*Peat, shale, and firewood.

**In this table consumption is the residual of production less net exports. The small changes in energy stocks, which cannot be allocated by type of fuel, are not included to preserve internal consistency.

***For this purpose, electricity exports are deducted from primary electricity, even though exported electricity can come from thermal electric plants as well.

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- A 157,000 b/d increase in the reexport of imported oil, primarily from Middle Eastern arms customers (43 percent of the total increase),

- A 59,000 b/d decrease in apparent oil consumption (16 percent)

- A 150,000 b/d increase in oil production (41 percent). [redacted] 25X1

Oil Use and Energy Efficiency

4. For two decades the USSR's ratio of energy use to GNP rose steadily--reaching a peak of 3.3 in 1980 (See Figure 2). In 1981 this ratio declined to about 3.2 and has remained relatively stable since then. The recent improvement in energy efficiency of Soviet economic activity appears to be related primarily to fuel substitution--the declining use of oil and coal and the rising use of gas per unit of GNP produced. Since gas can be burned more efficiently than coal and oil, a rise in the intensity of gas use and an accompanying decline in the intensity of use of other fuels historically have led to improved energy efficiency. These data also suggest that 1985 will be the first year in which the intensity of gas use in the Soviet economy will exceed that of oil.

5. The 1982-83 decline in energy intensity as measured by the energy-GNP ratio was small--from 3.20 to 3.19. Allowing for some improvement in efficiency due to the rise in gas usage relative to coal, energy conservation,

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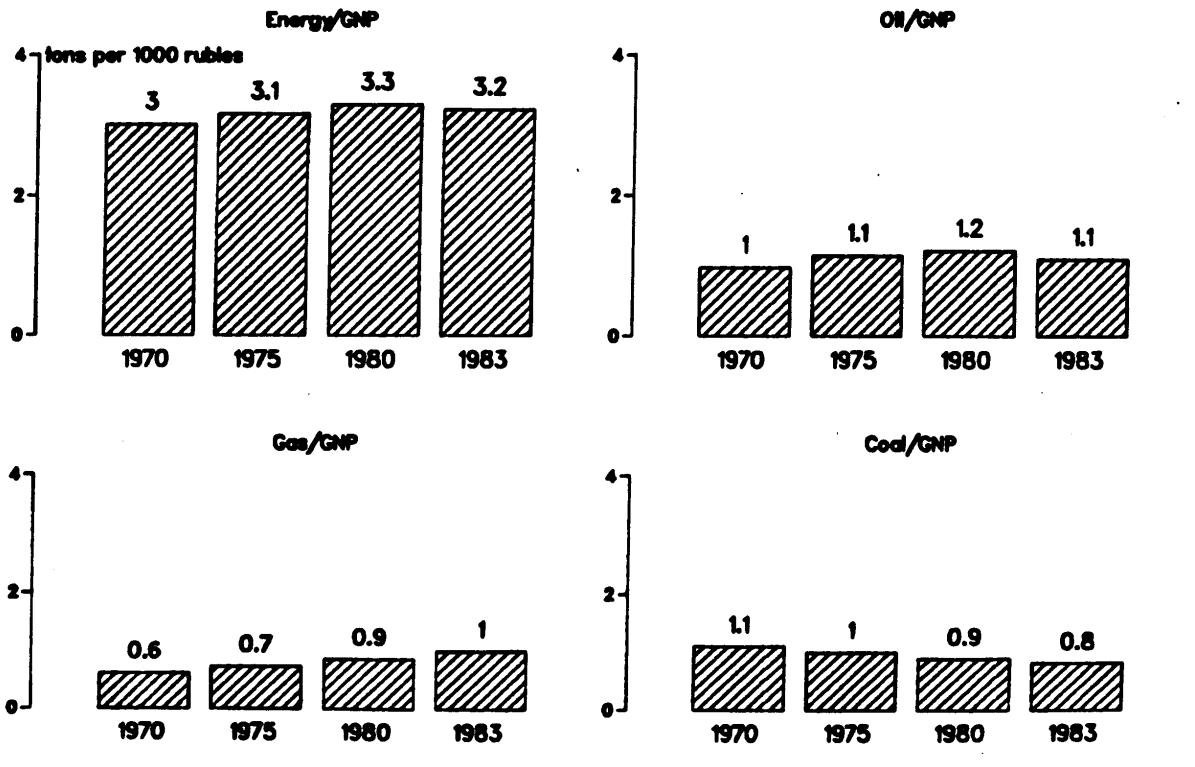
Figure 2
USSR: Trends in Energy Use Intensities
(million metric tons of standard fuel per billion 1970 rubles of gnp)



in the sense of using less of the same type of energy to obtain the same amount of output, clearly has been modest. [redacted] 25X1

The Oil Balance in 1984

5. At this point it is still too early to tell what will happen to Soviet oil consumption and trade this year. Production is expected to remain at about last year's level, 12.3 million b/d, with a slight decline possible. Full trade data on OECD countries is available only for first quarter, with incomplete data available for other trade partners. With large Soviet grain import needs anticipated and their lack of other exportable items, however, Soviet oil exports to the West will probably remain high. Given the preliminary indications on oil production and trade, and the trend since 1981, oil consumption in 1984 is likely to be at or somewhat below last year's level. The break in the long term upward trend in Soviet oil consumption, therefore, will probably continue at least through this year.

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